

23. CANNIBALISM IN THE EPILACHNA BEETLE, *HENOSEPILOACHNA SPARSA* HERBST. (COLEOPTERA: COCCINELLIDAE)

Cannibalism in phytophagous insects is an interesting phenomenon. The authors, while making ethological studies on the epilachna beetle, *Henosepilachna sparsa* Herbst., a phytophagous beetle, generally feeding on solanaceous plants, made the following observations on its occasional cannibalistic behaviour in the laboratory and in the field.

In the field, the beetles fed on the wild plant, *Datura fastuosa*, the leaves of which were used for rearing them in the laboratory. Under certain conditions, not yet fully understood, all the feeding stages of the beetle develop a transient cannibalistic tendency, even when fresh leaves of the host plant are available. The adults and the larvae then start eating the eggs. In one case, an adult beetle was observed consuming 11 eggs in about 30 minutes, leaving behind only small proximal parts of the chorion attached to the leaf. Laboratory studies also indicate that the female beetle prefers to eat eggs laid by other beetles, if available. The adult also eats all other immature stages. There are four larval instars and the larvae also sometimes feed on the lower instar larvae. In one instance, a late final instar larva fed on a pupa which was attached to the top of the rearing container by its posterior end. The larva attacked the pupa at its cephalic end and consumed most of its soft parts.

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March 29, 1969.

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24. A CONVENIENT METHOD OF COLLECTING THE LARVAE OF TIGER BEETLES (ORDER COLEOPTERA—FAMILY CICINDELIDAE) IN THE FIELD

The larvae of tiger beetles are predaceous creatures, living in burrows in the soil and are highly specialized for their mode of life and feeding. During the day, the larva generally remains at the top end of the burrow, closing its opening with its head and prothorax, and waiting for prey. At the slightest vibration of the surrounding soil or movements of objects or shadows over or around the opening of the burrow, the larva quickly withdraws itself deep down the burrow.

The authors' experience has shown that the collection of the larvae of tiger beetles in the field is indeed a somewhat tricky business for many

reasons. For one thing, the larva very rapidly moves down the burrow in reaction to slightest disturbance, mechanical or visual. The burrows run quite deep and are narrow. The collection of larvae by digging does not yield satisfactory results because, in more than seventy-five per cent of the attempts, the larvae either escape notice and are lost or may be crushed and damaged. The burrows do not always take a directly vertical course downwards but may often deviate slightly from the vertical, in all directions and this makes the process of tracing their course particularly difficult. Further, collection by digging takes a long time, as the soil has to be removed bit by bit in order to be able to follow the burrow down to its bottom.

The authors have been able to collect within a relatively short time and with greater success, large numbers of all instars of the larvae of the tiger beetle, *Cicindela cancellata* Dej. in the field, by the following convenient method. First of all, the habitat of the larvae is determined from the presence of neat, circular openings of their burrows in sandy areas during the period of abundance of tiger beetles. A rectangular strip of steel sheet, about 5 centimetres wide, 25 centimetres long and about 0.5 centimetre thick is prepared and the edge of one of its ends is sharpened. The collector sits or squats about half a metre away from the burrow, holding the steel strip, the sharpened end of which is made to rest flat on the ground, between the burrow and the collector and about 5 centimetres away from the opening of the burrow. The larva, on seeing the approach of the collector, quickly withdraws itself. The collector should be watching the opening of the burrow and generally, within a minute, the larva comes to the surface and its dark head and prothoracic parts appear at the opening of the burrow. At this very moment, the collector briskly drives the steel strip into the soil and across the burrow at an angle of about 45 degrees so that the burrow is blocked at about 5-10 centimetres below the soil surface. The larva is now trapped above the steel strip. This part of the operation should almost coincide with the appearance of the head of the larva at the opening of the burrow. Otherwise, even if the action is slightly delayed, the larva may either be damaged by the blade or may even escape by moving deep down.

The soil above the steel strip is slowly raised by levering the end of the strip upwards carefully and the larva is easily spotted and collected.

Grateful acknowledgement is made of a grant from the University Grants Commission to one of the authors (A.B.S.).

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May 2, 1968.